UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/728,096	12/01/2000	Rajendra Kumar Bera	JA999-704	4541

30449	7590	10/20/2006		

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EXAMINER
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ART UNIT	PAPER NUMBER
2191	

DATE MAILED: 10/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *22 September 2006*.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-8, 10-13 and 15-18* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-8, 10-13, 15-18* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some * c) ☐ None of:

        1. ☐ Certified copies of the priority documents have been received.

        2. ☐ Certified copies of the priority documents have been received in Application No. _____.

        3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1.   This action is in response to the amendment filed after the Final Office action dated on 07/25/06.

The Applicants' filing reply is to result from a request for Interview, on 08/30/06. The Office action

that made **Final on 07/25/05 is withdrawn.**

Claims **1-8, 10-13, 15-18** are pending in the application.

Regarding the amendment to the abstract filed on 5/11/06 including a new context identified by

Examiner as adding new Subject matter in the specification,

"The source code is compiled into object code, wherein the source code includes the two algebraic
expressions, and wherein the compiling includes the recasting, file reducing, and the comparing. The
method, apparatus, and computer program product may be used in compiler optimisation of source code
and like computing tasks":

As in the arguments in the interview, and in the remarks, Applicants point out that compiler

compiles source code into executable code has been known and understood in the field of programming,

therefore with the new added subject in the abstract can not be new subject matter.

Accordingly, Examiner will **withdraw the objection.** However, it would indicate that the features claimed

as ***compiling said source code into object code***, *wherein said source code comprises said two*

*algebraic expressions, and wherein said **compiling comprises** said recasting said reducing, and said*

comparing., are the Applicants' admitted act, as done by a prior art.

In view of the arguments in the remarks: the rejection of double patenting under copending

Application No. **11/231,091,** (U. S. Patent Application Publication No. 20060015550 A1), the rejection

under 35 U.S.C. 112, first paragraph, and the rejection under 35 U.S.C 101, in the prior Final Office

action, are withdrawn.

Response to Arguments

2.   The arguments have been considered but they are moot because **this action is non-final**.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness

rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as
> set forth in section 102 of this title, if the differences between the subject matter sought to be
> patented and the prior art are such that the subject matter as a whole would have been obvious
> at the time the invention was made to a person having ordinary skill in the art to which said
> subject matter pertains. Patentability shall not be negatived by the manner in which the invention
> was made.

4.   Claims 1-8, 10-13, 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over the

rules of Algebra.

Given the broadest reasonable interpretation of followed claims in light of the specification.

<u>As per Claim 1</u>:

Official notice is taken that the Algebraic rules discloses the Claimed limitations:

The algebraic rules disclose,

A method of determining, in a computer environment, the equivalence, if any, of two algebraic

expressions for use in compiler optimisation of source code and like computing tasks, said method

comprising the steps of:

Algebra rules show (a): For example, take (a+b)(a-b), one expression and a^2-b^2, another expression, they

are equivalent and will be recasting into a form **a*a -a*b+a*b-b*b**, by using the known rules of algebra.

(a) recasting said expressions into a form of one or more token pairs arranged sequentially in a string,

each said token pair comprising an operator followed by an operand;

Algebra rules show (b): For example **a*a -a*b+a*b-b*b** is reduced by algebraic rules as **a*a-b*b**.

(b) reducing said strings in accordance with a set of predetermined simplifying rules;

Algebra rules show (c): For example (a+b)(a-b) = a*a-b*b; and a^2-b^2 is another expression of a*a-b*b. In

fact (a+b)(a-b) equals to a^2-b^2, equals *to* a*a -a*b+a*b-b*b.

(c) comparing the reduced strings by matching, to detect equivalence of the two algebraic expressions.

With limitation,

(c1) **compiling said source code into object code,** *wherein said source code comprises said two*

algebraic expressions, and wherein said compiling comprises said recasting said reducing, and said

comparing.,

Official notice is also taken that compilation definition in general is to convert source code into object code

because it is known in the art, and admitted by Applicants as known and is prior art.

Therefore, it would be obvious to an ordinary in the art to apply rules/notation of algebra to

implement the claim, and it would be also obvious to an ordinary in the art to use compilation because it is

common in the art, as Applicants already admitted.

As per Claim 2: Algebraic rules disclose,

The method of claim 1,

whereby the recasting step (a) is preceded by a preconditioning step comprising, in relation to said

algebraic expressions, the following sub-steps according to whether a sub step applies: (da) deleting a

space in the expression; (db) removing a bracket in the expression by expanding a bracketed sub-

expressions; (dc) inserting a unitary operator at the start of the expression; (dd) recasting a power factor,

being a variable being raised to a power in the expression, in an alternate form as one of: (dda) the power

factor being expressed as the variable multiplied by itself as many times as the power, if the power is a

positive integer; (ddb) the power factor being expressed as a reciprocal of the variable multiplied by itself

as many times as an absolute value of the power, if the power is a negative integer; (ddc) the power

factor being replaced by an appropriate function which can compute the power factor, if the power is not

an integer; (de) recasting a constant in the expression in exponential format; (df) substituting a "+"

operator in the expression by "+1*", a "1" being in exponential format, (dg) substituting a "-" operator in

the expression by "-1*", a "1" being in exponential format; and (dh) recasting a "division by a constant" in

the expression as multiplication by a reciprocal of the constant.

The example of (a+b)(a-b) and a^2-b^2 recasting into a form **a*a -a*b+a*b-b*b**, meet claim 2 because the

claim 2 preempts the rules of algebra.

For example, algebraic rules:

(da): "a+ b" or "a+b" are the same (space deleting);

(db): (a+b) and a+b are the same (bracket removing);

(dc): a and +a are the same (inserting);

(dd): a^2 or a*a are the same (power recasting), and the same as to sub (dda), (ddb), (ddc);

(de): 12 and .12*10^2 are the same;

Further addressed to (df), (dg) , and (dh); these limitations are also applied to algebraic rules.

<u>As per Claim 3</u>: Algebraic rules disclose Claim 3 because Claim 1 recites all rules of algebra (See

rationale addressed in Claim 2), where Claim 3 recites as,

The method of claim 1, whereby the simplifying rules in step (b) comprise: (ba) arranging token pairs into

subgroups; (bb) arranging operand tokens in an arranged subgroup in order; (bc) reducing the ordered

operands by consolidating one or more constants and eliminating variables of opposite effect to form

reduced subgroups; and (bd) consolidating one or more multiple instances of similar subgroups, to

produce a reduced string.

<u>As per Claim 4</u>: Algebraic rules disclose Claim 4 because Claim 4 recites all rules of algebra (See

rationale addressed in Claim 2), where Claim 4 recites as, *The method of claim 1, whereby an algebraic*

expression whose equivalence is to be determined contains an aliased variable, said method comprising

an additional sub-step of arranging an ordered list of aliases of the variable, and substituting a first alias in

the ordered list for all instances of the aliased variable in the expression.

<u>As per Claim 5</u>: Algebraic rules disclose Claim 5 because Claim 5 recites all rules of algebra (See

rationale addressed in Claim 2), where Claim 5 recites as, *The method according to claim 1, whereby an*

algebraic expression whose equivalence is to be determined contains a function, said method comprising

additional sub-steps of: reducing function arguments using the set of predetermined simplifying rules; and

replacing the function by a tagged string, said string designating a function name, parameter types, and

arguments, whereby the tag distinguishes the function name from a variable.

As per Claim 8: Algebraic rules disclose Claim 8 because Claim 8 recites all rules of algebra (See

rationale addressed in Claim 2).

As per Claim 6: Claim 6 recite an apparatus, which has functionality equivalent to Claim 1. See rationale

addressed in Claim 1.

As per Claims 10-13: As further limitations from Claim 6, Algebraic rules disclose claims 10-13. See

rationale addressed in Claim 2.

As per Claim 7: Claim 7 recites a computer program product, which has functionality equivalent to Claim

1. See rationale addressed in Claim 1.

As per Claims 15-18: As further limitations from Claim 7, Algebraic rules disclose claims 15-18. See

rationale addressed in Claim 2.

Conclusion

5.   Any inquiry concerning this communication or earlier communications from the examiner should

be directed to Ted T. Vo whose telephone number is (571) 272-3706. The examiner can normally be

reached on 8:00AM to 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wei

Y. Zhen can be reached on (571) 272-3708.

The facsimile number for the organization where this application or proceeding is assigned is the

Central Facsimile number **571-273-8300**.

Any inquiry of a general nature or relating to the status of this application should be directed to

the TC 2100 Group receptionist: 571-272-2100. Information regarding the status of an application may

be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR. Status information for

unpublished applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TTV
October 16, 2006

**TED VO
PRIMARY EXAMINER
TECHNOLOGY CENTER 2100**